Short title: Impulsive behaviors in pathological buying

# Impulsive behaviors in patients with pathological buying

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ABSTRACT

*Aim:* To investigate impulsive behaviors in pathological buying (PB). *Method:* The study included three groups matched for age and gender: treatment seeking outpatients with PB (PB+), treatment seeking psychiatric inpatients without PB (PB-), and a healthy control group (HC). PB was assessed by means of the Compulsive Buying Scale and by the impulse control disorder (ICD) module of the research version of the Structured Clinical Interview for DSM-IV (SCID-ICD). All participants answered questionnaires concerning symptoms of borderline personality disorder, self-harming behaviors, binge eating and symptoms of attention deficit and hyperactivity disorder (ADHD). In addition, comorbid ICDs were assessed using the ICD-SCID. *Results:* The PB+ and the PB- group did not differ with regard to borderline personality disorder or ADHD symptoms, but both groups reported significantly more symptoms than the HC group. Frequencies of self-harming behaviors did not differ between the three groups. Patients with PB were more often diagnosed with any current ICD (excluding PB) compared to those without PB and the HC group (38.7% vs. 12.9% vs. 12.9%, respectively, $p$=0.017). *Discussion:* Our findings confirm prior research suggesting more impulsive behaviors in patients with and without PB compared to healthy controls. The results of the questionnaire-based assessment indicate that outpatients with PB perceive themselves equally impulsive and self-harm as frequently as inpatients without PB; but they seem to suffer more often from an ICD as assessed by means of an interview.

**Keywords:** Pathological buying, impulsivity, borderline personality, self-harm, attention deficit hyperactivity disorder, binge eating

## INTRODUCTION

Pathological buying (PB) is characterized by a maladaptive preoccupation with buying and shopping resulting in repetitive purchasing of consumer goods in order to relief stress, to escape from negative feelings such as anxiety, depression, tension, or boredom, and to enhance a poor sense of self (McElroy et al., 1994; Müller, Mitchell, & de Zwaan, 2015; Schlosser et al., 1994). PB may occur in bricks-and-mortar-based stores as well as via paper catalogues, TV-shopping channels or via the Internet. The products which are bought are mostly not used and patients quickly lose interest in the purchased items. Nevertheless, the desire to shop and buy reoccurs, which leads to further excessive, inappropriate buying sprees while losing control over buying. Patients with PB usually spend far beyond their means which can cause distress and also indebtedness, interference with occupational and social functioning, family break-ups, and occasionally even unlawful behavior (e.g., pretending the ability to pay, fraud) (McElroy et al., 1994; Schlosser et al., 1994). Although prevalence estimates of PB in population-based studies showed relatively high prevalence rates, ranging from 5 to 8%, with higher rates in young adults (e.g., Koran et al., 2005; Maraz et al., 2015; Mueller et al., 2010; Müller et al., 2015; Neuner et al., 2005; Otero-López et al., 2014), PB remains neglected or minimized in clinical practice.

Previous research has clearly highlighted the role of impulsivity in PB. Impulsivity is considered a multifaceted construct characterized by acting rashly without considering future consequences (Barratt, 1985; Cyders & Smith, 2008), novelty seeking (Cloninger, 1994), and approach behavior triggered by a high sensitivity to rewarding stimuli (Gray, 1970). Questionnaire-based data from volunteers suggested high positive correlations between PB and positive/negative urgency (the tendency to act rashly while in positive/negative mood) (Billieux et al., 2008; Rose & Segrist, 2014) and impulsivity (Black et al., 2012; Vogt et al., 2015; Williams & Grisham, 2012). The few studies that investigated impulsivity in PB using behavioral tasks produced mixed results. While individuals with PB performed worse in some

tasks (e.g., Cambridge Gambling Task, Iowa Gambling Task) indicating a higher approach tendency and more impulsive decision-making (Derbyshire et al., 2014; Trotzke et al., 2015; Voth et al., 2014), other performance-based tasks (e.g. Game of Dice Task, Stroop Task) did not show significance differences between individuals with PB and healthy controls (Black et al., 2012; Trotzke et al., 2015; Vogt et al., 2015). These findings indicate that individuals with PB perceive themselves as more impulsive than their healthy counterparts when assessed by means of self-reports; however, this difference was not always reflected in the performance on behavioral tasks (Vogt et al., 2015).

There also exists robust empirical support for the comorbidity of PB with other impulsive disorders. Findings from convenience samples recruited in fitness centers suggested a significant positive relationship between PB and exercise dependence (Lejoyeux et al., 2008) and hypersexuality (Müller et al., in press). With regard to clinical samples, prior studies found a positive association between PB and eating disorders of the binge eating/purging type (Claes et al., 2011; Fernàndez-Aranda et al., 2006, 2008; Jiménez-Murcia et al., 2015; Mueller et al., 2009), substance use disorders (Di Nicola et al., 2015; Lejoyeux et al., 2006; Mitchell et al., 2002), pathological gambling (Black et al., 2015; Grant & Kim, 2003), excessive Internet use (Claes et al., 2012; Mueller et al., 2010; Mazhari, 2012), and other impulse control disorders (ICDs) such as intermitted explosive disorder (Christenson et al., 1994; Mueller et al., 2009). Also, studies concerning the relationship between PB and ADHD indicated a high comorbidity between both conditions in community (Brook et al., 2015) as well as patient samples with PB (Black et al., 2012).

In terms of cluster B personality disorders, symptoms of PB showed positive correlations with borderline personality disorder (BPD) symptoms in patients seen in an internal medicine clinic (Sansone & Wiedermann, 2012 ), in an obstetrics/gynecology clinic (Sansone et al., 2013), and in shopping mall visitors (Maraz et al., 2015). Earlier studies in treatment-seeking patients with PB reported BPD prevalence rates ranging from 15 to 20%

(Mueller et al., 2009; Schlosser et al., 1994). Despite the overlap between PB and BPD, self-harming behaviors which are common in BPD, have rarely been examined in patients with PB. Sansone and Wiedermann (2012) investigated a large sample of primary care patients and found more self-harming behaviors in participants who engaged in excessive spending. As far as we know, only Jiménez-Murcia et al. (2014) explored self-harming behaviors in patients with PB, and reported a prevalence rate of 26.7%. Furthermore, it is noteworthy that patients with PB also suffer from high comorbidity with depressive and anxiety disorders, obsessive-compulsive disorder (OCD), and hoarding disorder (for review see: Müller, Mitchell, & de Zwaan, 2015).

As mentioned above, several studies investigated impulsive behavior in patients with PB compared to healthy controls (Black et al., 2015; Trotzke et al., 2015; Voth et al., 2014; Vogt et al., 2015) or patients with another impulsive disorder (Jiménez-Murcia et al. , 2015; Williams, 2012). For example, Jiménez-Murcia et al. (2015) found commonalities in impulsivity features (i.e. novelty seeking) between patients with PB, gambling disorder, and bulimia nervosa. To our knowledge, no study to date compared treatment-seeking patients with PB with patients seeking treatment for any mental disorder but PB in terms of impulsive behaviors. The comparison is of interest as it will give an indication if patients suffering from an ICD are generally more impulsive and if the difference in impulsivity is a question of quantity or quality. Therefore, the present study aimed at investigating similarities and differences in impulsive behaviors between patients seeking treatment for PB and age and gender matched treatment-seeking patients with different psychiatric disorders. In addition, both groups were compared with healthy controls who had never been involved in psychotherapy. The groups were compared with respect to the following impulse-related conditions: borderline personality disorder, ADHD, binge eating, and ICDs. We hypothesized that both clinical groups (PB+, PB-) will report more impulsive behaviors than healthy controls and that the number of impulsive behaviors will be higher in patients with PB than in

those without PB. Given the lack of information about the prevalence of self-harming behaviors in individuals with PB, we additionally explored the presence of self-harming behaviors in the three groups.

## METHODS

### Participants

The data of the treatment seeking outpatients with PB (PB+) and of the healthy control group (HC) were gathered from another study that investigated temperament features in PB (Voth et al., 2014). For the present study, we collected additional data from consecutive patients without PB (PB-) who were treated at a psychotherapy unit. Each group included 31 participants. The groups were matched for age and gender (i.e., 25 females and 6 males). Exclusion criteria were bipolar disorder, psychosis, and insufficient knowledge of the German language. Exclusion criteria for the healthy controls and the treatment seeking inpatients were symptoms of PB as measured with the Compulsive Buying Scale (see below).

### Measures

All participants provided information about age, gender, marital status, and education. Information concerning psychiatric disorders of patients with PB and without PB was taken from the patients' charts.

The Compulsive Buying Scale (CBS; Faber & O'Guinn, 1992; German version: Mueller et al., 2010) was used to screen for current PB. The scale includes nine items that assess motivational and financial aspects of PB. Lower CBS scores indicate more PB, the cut-off for PB was found to be equal or below -1.09 (Mueller et al., 2010). Cronbach´s $\alpha$ of the CBS in the present sample was 0.95.

A modified version of the ICD module of the research version of the Structured Clinical Interview for DSM-IV (SCID-ICD; First, 2002) was used to assess current PB and

other current ICDs (i.e. intermitted explosive disorder, kleptomania, trichotillomania, dermatillomania, gambling disorder, pathological internet use other than online shopping, non-paraphilic hypersexual behavior, and excessive exercise). The interviews were conducted face-to-face by four doctoral students (1 MD and 3 PhD students) who were experienced in working with psychiatric patients. All assessors were trained in a standardized format beginning with observations of life interviews. Afterwards, they conducted a series of interviews which were reviewed by the last author. During the whole study period, all assessors were under continuous supervision by the last author.

The 23-item Borderline Symptom List (BSL-23; Bohus et al., 2009; Wolf et al., 2009) was administered to quantify current borderline personality disorder symptoms. Cronbach´s α of the BSL in the present sample was 0.95. The questionnaire consists of 11 supplementary items that were used to assess the presence/absence of potential self-harming behaviors during the past week such as cutting/burning/strangling/head banging, suicidal ideation, suicide attempts, vomiting, high-risk behavior (e.g., driving too fast, running around on the roofs of high buildings, balancing on bridges), alcohol/drug consumption, medication intake without prescription or more than prescribed, uncontrolled rages, and regrettable uncontrollable sexual encounters. Non-suicidal self-injury (NSSI) was assessed based on a combination of an affirmative answer on the first supplementary item ('I hurt myself by cutting, burning, strangling, head banging, etc.') and a negative response to the third supplementary item ('I tried to commit suicide.'). This approach followed the suggestions that NSSI constitutes any direct form of self-harming behavior in the absence of suicidal intent (Claes & Vandereycken, 2007).

The ADHD index of the Connors Adult Attention Deficiency Hyperactivity Disorder Rating Scale, self-report short version (CAARS S:S; Conners et al., 1999; German version: Christiansen et al., 2011) was used to assess current ADHD symptoms. The ADHD Index can range from 0 to 36. Cronbach´s α of the ADHD index (12 items) was 0.84.

Item 15 of the German version of the Eating Disorder Examination-Questionnaire ("Over the past 28 days, on how many days have episodes of overeating occurred [i.e. you have eating an unusually large amount of food and have had a sense of loss of control at the time]?") (EDE-Q; Hilbert & Tuschen-Caffier, 2006) was used to assess the number of binge eating episodes within the last 28 days.

**Statistical analyses**

All analyses were performed by means of IBM Statistical Package for Social Sciences (SPSS, version 23.0). Descriptive statistics were generated for all variables. One-way analyses of variance (ANOVAs) were used to compare the three groups with regard to continuous measured variables. Comparisons of the three groups with respect to categorical variables were performed by means of the $\chi^2$-test statistic. Fisher's exact test was used when one or more of the cells had an expected frequency of five or less. Statistical significance was defined as $p < .05$.

**Ethics**

The study procedures were carried out in accordance with the Declaration of Helsinki. After being informed about the aims of the study, all participants provided written informed consent. The research protocol was approved by the Institutional Ethics Committee of the Hannover Medical School.

RESULTS

**Sociodemographic variables and pathological buying**

Table 1 displays the results of the sociodemographic variables for each of the three groups. Since the groups were matched by age and gender (25 females and 6 males), no group differences were found with regard to these variables. The groups also did not differ with

respect to partnership status. In terms of education, the HC group reported on average more years of education than both clinical groups. Those participants acquired more often a school diploma qualifying for university admission as well as attending university itself.

As expected, the PB+ group showed significantly lower CBS means (indicating more PB) than the other two groups ($M_{PB+}$=-5.07, $SD_{PB+}$=1.60 vs. $M_{PB-}$=2.24, $SD_{PB-}$=1.17 vs. $M_{HC}$=2.03, $SD_{HC}$=1.16, $F(2, 90)=305.41$, $p< .001$). While all patients of the PB+ group scored below the proposed CBS cut-off for PB, none of the participants of the other two groups reported CBS scores on a pathological level. Similarly, the diagnosis of current PB using the SCID-ICD was confirmed in all patients of the PB+ group. None of the patients of the PB- group and none of the participants of the HC-group met the diagnostic criteria for PB according to the SCID-ICD.

(Table 1)

**Psychiatric diagnoses**

While six of the 31 patients of the PB+ group had no comorbid psychiatric disorder, all 31 patients of the PB- group were diagnosed with at least one psychiatric disorder (any disorder: 80.6% vs. 100%, $\chi^2$=6.64, $df$=1, $p$= .010). Table 2 provides more detailed information about the occurrence of specific clinical (axis-I) and personality disorders (axis-II) in each group. The PB+ group did not differ from the PB- group with respect to specific clinical (axis-I) or personality (axis-II) disorders.

**Impulsive behaviors**

As can be seen in Table 3, the PB+ and the PB- group reported more borderline personality disorder features and adult ADHD symptoms than healthy controls, but they (PB+ vs. PB-)

did not differ significantly from each other. No differences between the three groups emerged with respect to the number of binge eating episodes or the presence of self-harming behavior.

Figure 1 demonstrates the distribution of specific ICDs across the groups. PB+ patients were more often diagnosed with at least one current ICD (other than PB) than those without PB or healthy controls (38.7% vs. 12.9% vs. 12.9%, $\chi^2$=8.15, *df*=2, *p*= .017). The prevalence rates of dermatillomania and intermittent explosive disorder were relatively high among PB+ patients compared to the other groups, whereas only the group difference concerning dermatillomania reached statistical significance (exact $p<0.05$). None of the participants met the criteria for current kleptomania, and none of the healthy controls fulfilled the criteria for pathological internet use, hypersexual behavior, trichotillomania, or gambling disorder.

(Table 2)

(Figure 1)

## DISCUSSION

The findings of this study indicate that treatment-seeking patients exhibit more impulsive behaviors than healthy controls. Furthermore - at least in the present sample – treatment-outpatients with PB did not perceive themselves as more impulsive than inpatients without PB; but they were more often diagnosed with a comorbid ICD than both healthy controls and inpatients not suffering from PB. In contrast to the comparable level of impulsivity measured via questionnaires in the clinical groups (PB+ and PB-), the clinical interview revealed a higher prevalence of any current ICD in patients with PB. This result is only partly in line with our hypothesis as we had expected that patients with PB will show more impulsive behaviors as measured via questionnaires and clinical interview than the two other groups.

Several reasons for the mixed results merit discussion. First, the applied questionnaires certainly measured other aspects of impulsivity (i.e. binge eating, ADHD, borderline symptoms, self-harm) than the clinical interview for ICDs. Therefore, our interview-based data rather complement than confirm the questionnaire-based findings. Second, it is important to bear in mind that the BSL-23, the CAARS, and the EDE-Q are continuous measures with dimensional (quantitative) outcomes, whereas the clinical interview produced categorical outcomes, namely psychiatric diagnoses. The third consideration pertains to the different answer format of the self-report questionnaires and the interview (Harris & Brown, 2010). In the BSL-23 and the CAARS, participants responded by selecting predetermined answer alternatives (i.e. frequencies). In contrast to these highly structured questionnaires, the clinical interview encouraged participants to provide more detailed information and clarification about the particular symptoms. On the other hand, participants might have been more willing to provide honest information that was not socially desirable such as frequencies of self-harming behaviors by answering questionnaires. In terms of interviews, the lack of data on inter-rater reliability limits the interpretation of the data. Moreover, we did not ensure rater blindness. Hence, although interviewers in our study were experienced assessors trained in diagnosing ICDs, we cannot rule out that the interview-based results were influenced by assessors' subjectivity.

It is also noteworthy that the PB+ and the PB- group did not differ significantly with regard to clinical and personality disorder diagnoses (see Table 2). This may have also contributed to the lack of differences in questionnaire outcomes between the two groups.

According to Black et al. (2015), PB belongs to a spectrum of "behaviorally-defined" conditions that share the main feature of "behavioral dyscontrol that places the individual in conflict with other persons or society" (Black et al., p. 273). Therefore, the high occurrence of ICDs in the PB+ group is not surprising given the shared characteristics of PB and other ICDs such as repetitive failures to resist an impulsive act or behavior that may be harmful to self or

others. In Connection with the lack of differences in the self-perception of being impulsive this might indicate that the level of urge (i.e. impulse) is the same in patients with different psychological problems, but the PB+ group is unable to resist the urge and therefore develops maladaptive behaviors. Recent research by Horváth et. al (2015) into the regulatory strategies of pathological buyers support this idea as it was found that pathological buyers actively engage in self-control attempts and still not being able to change their behavior. Deficits in top-down control could be another explanation for this phenomenon. Previous research found reduced ventral striatal activity during the anticipatory phase of reward processing, especially in individuals with ICDs (Potenza, 2014) which hints to a neurobiological component.

The present study is not without limitations. As already mentioned above, the interview-based findings were restricted by the lack of rater blindness and the absence of information on inter-rater reliability. Unfortunately, the time course or onset of ICDs was not assessed. Hence, it is unknown whether comorbid ICDs developed prior to or after PB accelerated to a clinical level. In terms of questionnaires, we used self-ratings referring to specific impulsive conditions but not to trait impulsivity. We cannot exclude that measures of general trait impulsivity would have produced different results. Furthermore, the sample sizes of the three groups were relatively small. The lack of power could explain the relatively low rates of self-harming behaviors in all three groups and the lack of significant group differences, accordingly. Moreover, the applicability of our results is constricted to treatment-seeking, mostly female in- and outpatients. Last but not least, the cross-sectional design prevents us from making any causal interpretation. Therefore, our results should be viewed as preliminary.

## CONCLUSIONS

Taken together, our findings suggest that in treatment-seeking patients the presence of PB may be associated with a higher risk for comorbid ICDs but not necessarily for other

impulsive or self-harming behaviors. Because ICDs appear common in individuals with PB, it seems important to screen for ICDs in this population (Grant et al., 2014; Müller et al., 2011). Otherwise, they may remain untreated which could worsen the treatment outcome. Future retrospective or longitudinal studies should examine the chronological order in which the disorders appear and how they influence each other. Also further research is required to examine the possible underlying neurobiological reasons for impaired impulse control in patients with pathological buying.

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**Figure 1: Prevalence rates of current impulse control disorders in patients with pathological buying (PB+), without pathological buying (PB-), and healthy controls (HC)**

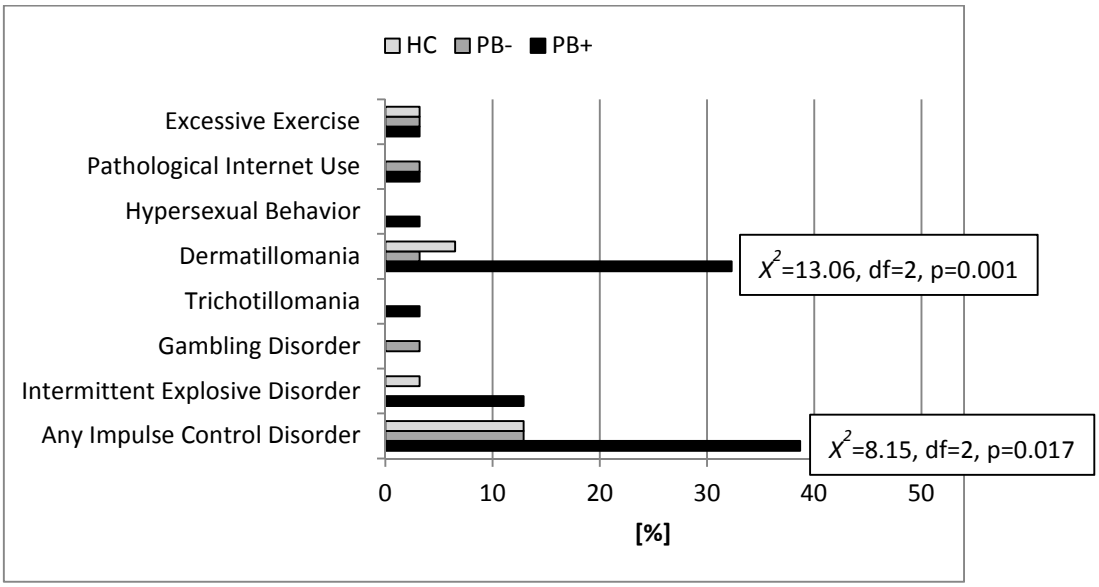


**Table 1: Sociodemographic characteristics**

| | **Patients with PB** (n=31) | **Patients without PB** (n=31) | **Healthy controls** (n=31) | **Group comparison** |
|---|---|---|---|---|
| Age, years (mean, SD,) | 40.65 (11.2) | 40.58 (11.6) | 40.06 (10.3) | $F$=(2,92), $p$=0.975 |
| Partnership status | | | | |
| Married/living in a couple relationship (N, %) | 10 (32.2) | 13 (41.9) | 10 (32.2) | $F$=9.035, $df$=6, $p$=0.172 |
| Single (N, %) | 11 (53.5) | 13 (41.9) | 11 (53.5) | |
| Widowed, divorced, separated (N, %) | 10 (32.3) | 3 (9.7) | 10 (32.3) | |
| Other (N, %) | 0 (0.0) | 2 (6.5) | 0 (0.0) | |
| ≥12 school years (N, %) | 10 (32.3)[a] | 12 (38.7)[a] | 20 (64.5)[b] | $\chi^2$=7.29, $df$=2, $p$=0.026 |

*Note.* Values with different superscripts are significantly different.

**Table 2: Prevalence of axis-I and personality disorders among patients with pathological buying (PB+) and without pathological buying (PB-)**

| | **PB+** (n=31) | **PB-** (n=31) | **Group comparison** |
|---|---|---|---|
| | *N* (%) | *N* (%) | |
| **Axis-I Disorders** | | | |
| Any Depressive Disorder | 18 (58.1) | 18 (58.1) | $\chi^2$=8.881, *df*=4, *p*=0.064 |
| Any Anxiety Disorder | 3 (9.7) | 3 (9.7) | |
| Any Somatoform Disorder | 1 (3.2) | 2 (6.4) | |
| Any Eating Disorder | 3 (9.7) | 8 (25.8) | |
| **Personality Disorders** | | | |
| Borderline | 1 (3.2) | 4 (12.9) | $\chi^2$=3.970, *df*=4, *p*=0.410 |
| Narcissistic | 1 (3.2) | 1 (3.2) | |
| Avoidant | - | 1 (3.2) | |
| Obsessive-Compulsive | 1 (3.2) | - | |

**Table 3: Self-reported impulsive symptoms and self-harming behaviors**

| | **Patients with PB** (n=31) | **Patients without PB** (n=31) | **Healthy contr** (n=31) |
|---|---|---|---|
| Number of binge eating episodes within last 28 days[1] *(M, SD)* | 3.29 (7.58) | 3.87 (8.82) | 0.74 (2.78) |
| ADHD Index[2] *(M, SD)* | 14.55 (6.99)[a] | 15.83 (6.62)[a] | 7.42 (3.29)[b] |
| Borderline Symptom List-23 *(M, SD)* | 1.12 (0.96)[a] | 1.31 (0.73)[a] | 0.23 (0.30)[b] |
| Any self-harming behavior[3] *(N, %)* | 9 (29.0) | 11 (35.5) | 7 (22.6) |
| Cutting/burning/strangling/headbanging[2] *(N, %)* | 2 (6.5) | 4 (12.9) | - |
| Suicidal ideation *(N, %)* | 2 (6.5) | 2 (6.5) | - |
| Suicide attempts *(N, %)* | 1 (3.2) | 1 (3.2) | - |
| Vomiting *(N, %)* | 5 (16.1) | 2 (6.5) | - |
| High-risk behavior *(N, %)* | 3 (9.7) | 4 (13.3) | - |
| Got drunk *(N, %)* | 4 (12.9) | 1 (3.2) | 6 (19.4) |
| Drug Use *(N, %)* | 1 (3.2) | 1 (3.2) | - |
| Medication without prescription / more than prescribed *(N, %)* | - | 3 (9.7) | 1 (3.2) |
| Uncontrolled rages *(N, %)* | 3 (9.7) | 4 (12.9) | - |
| Regrettable uncontrollable sexual encounters *(N, %)* | 2 (6.5) | - | 1 (3.2) |

*Note.* Values with different superscripts are significantly different. [1]measured with the Eating Disorder Examination-Questionnaire, [2]measured with the Connors Adult Attention Deficiency Hyperactivity Disorder Rating Scale, [3]measured with the supplementary items of the Borderline Symptom List-23